

PATENT COOPERATION TREATY

From the
INTERNATIONAL SEARCHING AUTHORITY

To:

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PCT

WRITTEN OPINION OF THE
INTERNATIONAL SEARCHING AUTHORITY

(PCT Rule 43bis.1)

Date of mailing
(day/month/year)

12-10-2004

Applicant's or agent's file reference
ARQ-001PCT

FOR FURTHER ACTION

See paragraph 2 below

International application No.

PCT/SE 2004/001147

International filing date (day/month/year)

21-07-2004

Priority date (day/month/year)

21-07-2003

International Patent Classification (IPC) or both national classification and IPC

G06K 9/00

Applicant

CELLAVISION AB ET AL

1. This opinion contains indications relating to the following items:

- ☒ Box No. I Basis of the opinion
- ☐ Box No. II Priority
- ☐ Box No. III Non-establishment of opinion with regard to novelty, inventive step and industrial applicability
- ☐ Box No. IV Lack of unity of invention
- ☒ Box No. V Reasoned statement under Rule 43bis.1(a)(i) with regard to novelty, inventive step or industrial applicability; citations and explanations supporting such statement
- ☐ Box No. VI Certain documents cited
- ☐ Box No. VII Certain defects in the international application
- ☐ Box No. VIII Certain observations on the international application

2. **FURTHER ACTION**

If a demand for international preliminary examination is made, this opinion will be considered to be a written opinion of the International Preliminary Examining Authority ("IPEA") except that this does not apply where the applicant chooses an Authority other than this one to be IPEA and the chosen IPEA has notified the International Bureau under Rule 66.1bis(b) that written opinions of this International Searching Authority will not be so considered.

If this opinion is, as provided above, considered to be a written opinion of the IPEA, the applicant is invited to submit to the IPEA a written reply together, where appropriate, with amendments, before the expiration of 3 months from the date of mailing of Form PCT/ISA/220 or before the expiration of 22 months from the priority date, whichever expires later.

For further opinions, see Form PCT/ISA/220.

3. For further details, see notes to Form PCT/ISA/220.

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WRITTEN OPINION OF THE
INTERNATIONAL SEARCHING AUTHORITY

International application No.

PCT/SE 2004/001147

Box No. I Basis of this opinion

1. With regard to the language, this opinion has been established on the basis of the international application in the language in which it was filed, unless otherwise indicated under this item.
☐ This opinion has been established on the basis of a translation from the original language into the following language _____, which is the language of a translation furnished for the purposes of international search (under Rules 12.3 and 23.1(b)).
2. With regard to any nucleotide and/or amino acid sequence disclosed in the international application and necessary to the claimed invention, this opinion has been established on the basis of:
 - a. type of material
☐ a sequence listing
☐ table(s) related to the sequence listing
 - b. format of material
☐ in written format
☐ in computer readable form
 - c. time of filing/furnishing
☐ contained in the international application as filed.
☐ filed together with the international application in computer readable form.
☐ furnished subsequently to this Authority for the purposes of search.
3. ☐ In addition, in the case that more than one version or copy of a sequence listing and/or table relating thereto has been filed or furnished, the required statements that the information in the subsequent or additional copies is identical to that in the application as filed or does not go beyond the application as filed, as appropriate, were furnished.
4. Additional comments:

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**WRITTEN OPINION OF THE
INTERNATIONAL SEARCHING AUTHORITY**

International application No.
PCT/SE 2004/001147

Box No. V Reasoned statement under Rule 43bis.1(a)(i) with regard to novelty, inventive step or industrial applicability; citations and explanations supporting such statement

1. Statement

Novelty (N)	Claims	<u>4</u>	YES
	Claims	<u>1-3, 5-6</u>	NO
Inventive step (IS)	Claims	<u>4</u>	YES
	Claims	<u>1-3, 5-6</u>	NO
Industrial applicability (IA)	Claims	<u>1-6</u>	YES
	Claims	<u></u>	NO

2. Citations and explanations:

Most relevant documents cited in the International Search Report:

D1: PRINCE J L et al.: "Gradient Vector Flow: A New External Force for Snakes", Proceedings of the IEEE Computer Society Conference on Computer Vision and Pattern Recognition, 1997, IEEE, Los Alamitos, CA, USA, ISSN 1063-6919, p. 66-71.

D2: PRINCE J L et al.: "Snakes, Shapes, and Gradient Vector Flow", IEEE Transactions on Image Processing, vol. 7, no. 3, March 1998.

D1 and D2 disclose a method for calculating a contour for an object presented in an image. The method includes means for segmenting the object of interest from other elements, such as background and noise. A so called "snake" is a parametric contour model, and the algorithm presented in D1 and D2 will iterate position and shape of the snake until an appropriate contour for the object of interest is established.

The applied invention relates to a method, arrangement and digital storage medium comprising a computer program for determining a sought object contour in a digital microscope image. The invention is similar to the method given in D1 and D2, but according to the description given in the application, an improvement in calculation speed is achieved by rewriting the two equations representing the gradient vector flow. The rewriting comprises a modification of the Laplace operator and then a Fourier transformation is performed.

.../...

Supplemental Box

In case the space in any of the preceding boxes is not sufficient.
Continuation of: BOX V

Referring to claims 1, 5, 6:

Claim 1 refers to a method for determining a sought object contour in a digital microscope image. The first step is to assign edge values to the image elements. Then a first and a second gradient vector component are applied to the image elements. An estimate of the sought contour is then calculated based on said two gradient vector components.

Claim 1 only include that edge values are computed and that the sought object estimate is based on a first and a second gradient vector component. In claim 1 nothing is mentioned about the rewriting and the Fourier transformation, which seems to be the crucial features of the applied invention.

D1 includes the features given in claim 1. Firstly, an edge map is calculated (see section 3.1), which corresponds to the assigned edge values in claim 1. The first and second gradient vector components, mentioned in claim 1, can be described in D1 (see section 3.2, equations 11a and 11b). The above equations are then utilized for calculating the contour of an object of interest.

D2 describes the same method as the one given in D1 (see section III.B.).

Claim 1 is formulated in such a generalized fashion that it fails to describe the essential features of the applied invention. The information given in claim 1 can be found in both D1 and D2.

In view of the above, the invention according to claim 1 lacks novelty.

The argumentation regarding claim 1 is also valid for the arrangement and digital storage medium comprising a computer program described in claim 5 and 6 respectively. Therefore, the invention according to claims 5 and 6 lacks novelty.

Referring to claims 2-3:

The invention according to claim 2 and 3 lacks novelty because the equations given in D1 (see section 3.2, equations 11a and 11b) includes a differentiation in one direction each in the image and a Laplace operator (corresponds to the Laplace filter given in claim 3).

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